-continued

Table of Reference Numerals

42	Electrodes	44	Shield electrodes
46	Ground electrodes	50	Ear portion
52	Stalk portion	54	Flexible printed circuit
58	Substrate layer	64	Axis

[0046] The foregoing is merely illustrative and various modifications can be made to the described embodiments. The foregoing embodiments may be implemented individually or in any combination.

1. An earbud, comprising:

a housing having an ear portion and an out-of-ear portion that protrudes from the ear portion;

a controller; and

capacitive sensing circuitry coupled to the controller, wherein the capacitive sensing circuitry includes:

ear electrodes in the ear portion; and

out-of-ear electrodes in the out-of-ear portion, wherein the capacitive sensing circuitry is configured to produce ear sensor data from the ear electrodes and out-of-ear sensor data from the out-of-ear electrodes, wherein the out-of-ear electrodes are uncovered when the earbud is located in a user's ear, and wherein the controller is configured to determine an operating state of the earbud based on the ear sensor data and the out-of-ear sensor data.

2. The earbud defined in claim **1** wherein the controller is configured to determine the operating state of the earbud by applying a classification process to the ear sensor data and the out-of-ear sensor data.

3. The earbud defined in claim **2** wherein the controller is configured to determine whether the operating state of the earbud is an in-ear operating state or an in-finger operating state by applying the classification process to the ear sensor data and the out-of-ear sensor data.

4. The earbud defined in claim **3** further comprising a speaker in the ear portion, wherein the controller is configured to pause audio playback with the speaker in response to detecting that the operating state changed from the in-ear operating state to the in-finger operating state.

5. The earbud defined in claim **4** further comprising a flexible printed circuit extending along an interior surface of a wall of the housing, wherein the flexible printed circuit includes metal traces forming the ear electrodes and the out-of-ear electrodes.

6. The earbud defined in claim **5** wherein the flexible printed circuit further comprises a ground electrode.

7. The earbud defined in claim **6** wherein the flexible printed circuit further comprises an active shield electrode.

8. The earbud defined in claim **7** wherein the active shield electrode is interposed between the ground electrode and the metal traces.

9. The earbud defined in claim **6** wherein the capacitive sensing circuitry comprises a capacitive sensor integrated circuit and wherein at least a portion of the ground electrode is interposed between the capacitive sensor integrated circuit and the active shield electrode.

10. The earbud defined in claim **5** wherein the interior surface is curved and wherein the flexible printed circuit is wrapped at least partly about an axis.

11. The earbud defined in claim **1** wherein the ear electrodes and the out-of-ear electrodes extend across all of the housing including the ear portion and the out-of-ear portion.

12. An earbud operable in an operating state, comprising:

a housing having an ear portion configured to be received in an ear and having an elongated out-of-ear portion that protrudes from the ear portion;

a speaker in the ear portion that is configured to emit sound through a speaker port opening in the ear portion;

ear capacitive sensing electrodes in the ear portion;

out-of-ear capacitive sensing electrodes in the out-of-ear portion; and

control circuitry configured to determine the operating state by classifying capacitive sensor data from the ear capacitive sensing electrodes and the out-of-ear capacitive sensing electrodes, wherein the control circuitry determines that the operating state is an in-ear operating state when the ear capacitive sensing electrodes are contacted and the out-of-ear capacitive sensing electrodes are uncontacted.

13. The earbud defined in claim **12** further comprising:

wireless communications circuitry configured to receive audio data to play with the speaker; and

a flexible printed circuit that conforms to an inner surface of the housing, wherein the out-of-ear capacitive sensing electrodes are formed on the flexible printed circuit.

14. The earbud defined in claim **13** wherein the ear capacitive sensing electrodes are formed on the flexible printed circuit.

15. The earbud defined in claim **14** further comprising an active shield and a ground on the flexible printed circuit, wherein at least some of the active shield is interposed between the ground and the out-of-ear capacitive sensing electrodes.

16. The earbud defined in claim **15** wherein at least some of the active shield is interposed between the ground and the ear capacitive sensing electrodes.

17. The earbud defined in claim **15** wherein the control circuitry includes a capacitive sensor integrated circuit coupled to the ear capacitive sensing electrodes and the out-of-ear capacitive sensing electrodes.

18. The earbud defined in claim **15** wherein the flexible printed circuit has a single common active shield for all of the ear capacitive sensing electrodes and out-of-ear capacitive sensing electrodes.

19. The earbud defined in claim **12** wherein the control circuitry is configured to pause audio playback with the speaker in response to determine the operating state has transitioned from the in-ear operating state to an out-of-ear operating state.

20. The earbud defined in claim **12** further comprising a non-capacitive-sensing sensor, wherein the control circuitry is configured to determine the operating state using data from the non-capacitive sensing sensor.

21. An earbud, comprising:

a housing having an ear portion and an elongated out-of-ear portion that protrudes from the ear portion;

a speaker in the ear portion that is aligned with a speaker port opening in the ear portion;

capacitive sensing electrodes that include first electrodes in the ear portion and second electrodes in the out-of-ear portion; and